DOCUMENT RESUME

ED 315 562 CE 054 013

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TITLE Microcomputer Use in Technical Education.
PUB DATE 89
NOTE 8p.
PUB TYPE Viewpoints (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; Computer Software; *Computer Uses in Education; *Decision Making; Decision Making Skills; Learning Strategies; Microcomputers; Postsecondary Education; *Problem Solving; Secondary Education; Teaching Methods; *Technical Education

ABSTRACT

Instructors in technical education need to use diverse methods of teaching to provide for individual differences among learners. Use of microcomputers is particularly appropriate, because such use can impart knowledge as well as develop skills. Three philosophies of computer/software instruction in technical education can be identified: (1) problem-solving procedures in which students identify and attempt to solve problems; (2) measurement-driven instruction (MDI) with its stress upon specific predetermined objectives for student attainment; and (3) decision-making strategies with learners selecting content to acquire in a rather open-ended environment. The problem-solving strategy is recommended, because problem solving is salient in the school curriculum as well as in life. MDI strategies could use subject matter acquired by students to solve life-like problems. Decision-making approaches might well emphasize using software content to solve problems. Thus, decision-making approaches may advocate students choosing, from among alternatives, problems to solve. (15 references.) (KC)

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MICROCOMPUTER USE IN TECHNICAL EDUCATION

Students need to achieve vital objectives in technical education. Each objective needs careful consideration and deliberation before acceptance for learner attainment. With the knowledge and skills objectives explosion, it behoves the technical education instructor to choose goals wisely which students are to attain.

Balance among objectives in technical education needs to be in evidence. Knowledge objectives stress salient facts, concepts, and generalizations which learners are to attain. Skills ends, as a second type of objective, emphasize students using what has been achieved as knowledge goals. Critical and creative thinking, as well as problem solving represent worthwhile skills in the technical education arena. A third objective to stress is attitudinal ends. Developing quality attitudes assists students to attain knowledge and skills goals. Thus, in technical education, these types of objectives are important for student attainment. These are knowledge, skills, as well as attitudinal goals.

Philosophy of Microcomputer Use in Technical Education

Instructors need to utilize diverse methods of teaching to provide for individual differences among learners. Each student is unique in terms of interests, achievement, capacity to learn, as well as in motivation. Thus instructors in technical education need to utilize diverse approaches in ongoing learning opportunities.

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Problem solving philosophies are vital to utilize in technical education. Software/computer use by students may be emphasized well within the framework of problem solving. Students with instructor guidance in a contextual situation identify a problem. The problem might arise within an ongoing software presentation on the monitor. Data or information in answer to the problem is then acquired by students from a variety of reference sources, including software content. A hypothesis should result in responding to the problem. A hypothesis is tentative, not an absolute, and subject to testing. Quality related software content, among other materials of instruction, might be utilized to test the hypothesis. If evidence warrants, the hypothesis may be revised.

Problems solving approaches in software/computer utilization stress the following:

1. a psychological, not a logical, technical education curriculum. Thus, students are rather heavily involved in sequencing their own experiences within the flexible steps of problem solving.
2. life-like, realistic problems identified and attempts made at developing viable solutions by learners.
3. the technical education curriculum being integrated with the societal arena. Technical education and society become one and not separate entities. What is vital in society then, becomes relevant in technical education.
4. the technical education instructor being a guide and stimulator, rather than a dispenser of content.

5. higher levels of cognition stressed within the flexible steps of problem solving.

A second philosophy to emphasize in computer usage is measurement driven instruction (MDI). Precise, measurably stated objectives need to be written prior to instruction in technical education. With instruction, a student either achieves or does not attain the stated objectives. Objectives in technical education are arranged in ascending order of complexity. Quality sequence may then be in evidence, as perceived by the instructor in technical education. Carefully select software content might well assist learners to attain the precise ends.

The instructor may announce the specific objectives prior to instruction for a particular lesson. Students then know what is expected of them as a result of interacting with particular software programs. After completing one or more software programs, students are tested to notice if objectives in technical education have been attained. Measurement of student progress is highly important in MDI. Criterion referenced tests aligned with the measurably stated objectives are a must. The test with clearly written test items might then be valid. Reliability to emphasize consistency of test results be it split-half, test-rest, or alternative forms, is needed to emphasize quality criterion referenced tests. After criterion referenced tests have been administered, the technical education instructor needs to evaluate the results. Each student needs to achieve optimally in the curriculum. The instructor might well develop a quality technical education curriculum after evaluating test results from students. Diagnosis and remediation concepts emphasized by the instructor

following evaluating student results should emphasize a specifically designed curriculum for each student.

Measurement driven instruction emphasizes the following in technical education:

1. software content which guides students to attain measurably stated objectives.
2. software content which is aligned with and directly related to the stated objectives.
3. software content which provides for individual differences so that learners individually attain objectives at their own optimal rate of progress.
4. software content which measures student achievement in terms of precise objectives.
5. software content which provides for the learning style of each student.

A third philosophy of instruction utilizing computers/software in technical eduation emphasizes a decision-making strategy. Diverse stations in a class setting may each house a computer with appropriate software to be stressed in ongoing sequential lessons and units. At each station, a task card lists relevant tasks for students to complete in technical education. Learners may then select sequential tasks to complete. Those tasks lacking perceived purpose may be omitted. A psychological computer/software curriculum is then in evidence since each student sequences his/her own learning opportunities.

The technical education instructor and the student may also emphasize a psychological curriculum using a contract system. The

student with instructor guidance plans a series of activities for the former to complete. The due date together with signatures of both the involved student and instructor needs to be in evidence. In a psychological software, students largely sequence and order their own experiences in selecting software content.

Decision-making strategies in utilizing computer/software within the framework of technical education emphasizes

1. heavy input by learners in selecting learning activities.
2. teacher guidance and encouragement to motivate optimal learner achievement.
3. student choices made in terms of personal interest, need, and purpose.
4. ample software on diverse topics and achievement levels to provide for individual differences.
5. individual endeavors and committee work based on student choice.

In Closing

Three philosophies of computer/software instruction in technical education were discussed. These included

1. problem solving procedures in which students identify and attempt to solve problems.
2. measurement driven instruction (MDI) with its stress upon specific predetermined objectives for student attainment.

3. decision-making strategies with learners selecting content to acquire in a rather open-ended environment.

The writer strongly recommends a problem solving strategy be utilized. Problem solving is salient in the school curriculum, as well as in life in society. MDI strategies could utilize subject matter acquired by students to solve life-like problems. Decision-making approaches might well emphasize using software content to solve problems. Thus, decision-mkaing approaches may advocate students choosing, from among alternatives, problems to solve.

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